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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/891,157	06/26/2001	Tyler Lowrey	2024.27	2906

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ENERGY CONVERSION DEVICES, INC.
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EXAMINER

PHAM, HOAI V

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/891,157

Applicant(s)

LOWREY ET AL.

Examiner

Hoai V Pham

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40, 42-57, 59-78, 80-82, 84-98, 101 and 102 is/are pending in the application.
- 4a) Of the above claim(s) 5-13, 16, 26-34, 47-56, 70-78 and 89-97 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 40, 42-46, 57-62, 82, 84-88 and 99-102 is/are allowed.
- 6) ☒ Claim(s) 1-4, 14, 15, 17-25, 35, 37-39, 63-69, 79, 81 and 98 is/are rejected.
- 7) ☒ Claim(s) 36 and 80 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of embodiment 2, figs. 1C and 2A-2S, claims 1-40, 42-57, 59-78, 80-82, 84-98 and 101-102 in Paper No. 8 is acknowledged.
2. Claims 5-13, 16, 26-34, 47-56, 70-78, and 89-97 are withdrawn from consideration because these claims do not read on the species of figs. 1C and 2A-2S.

Claim Objections

3. Claim 79 is objected to because of the following informalities:
Line 3, "raised" should be changed to --protruding--.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claim 14, 35, 98 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14, line 3, "semiconductor, and conductor" is not described in the specification.

Claim 35, "forming said memory material" renders the claim indefinite. It is not clear where "forming said memory material" comes from.

Claim 98, "said programmable resistance material" renders the claim indefinite. It is not clear where "said programmable resistance material" comes from.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-4, 14-15, 17-25, 35, 37-39, 63-69, 79, and 81 are rejected under 35 U.S.C. 102(e) as being anticipated by Doan et al. [U.S. Pat. 6,150,253].

With respect to claim 1, Doan et al. (figs. 1-12, cols. 6-8) discloses a method for making a programmable resistance memory element, comprising:

providing a conductive material (102) (see fig.1);

forming a sidewall spacer (104) over a portion of said conductive material (see fig.1);

removing a portion of said conductive material to form a protruding portion (114) of said conductive material under said spacer (see fig.6); and

forming a programmable resistance material (120) adjacent to at least a portion of said raised portion (see fig.10).

With respect to claim 2, Doan et al. discloses that the removing step comprises etching said conductive material (col. 7, lines 1-5).

With respect to claim 3, Doan et al. discloses that the etching step comprises anisotropically etching said conductive material (col. 7, lines 3-5).

With respect to claim 4, Doan et al. discloses that the etching step comprises isotropically etching said conductive material (col. 7, lines 3-5).

With respect to claim 14, Doan et al. discloses that the sidewall spacer (104) comprises a dielectric (col. 6, line 40).

With respect to claims 17-18, Doan et al. discloses that the programmable resistance material (120) comprises a phase change material (a chalcogen element) (col. 7, lines 55-59).

With respect to claim 19, Doan et al. (figs. 1-12, cols. 6-8) discloses a method for making a programmable resistance memory element, comprising:

providing a conductive layer (102) (fig. 1);

forming a protruding portion (114) of said conductive layer extending from an edge of said conductive layer (fig. 6); and

forming a programmable resistance material (120) adjacent to at a least a portion of said protruding portion (fig. 10).

With respect to claim 20, Doan et al. discloses that the forming said protruding portion step comprises:

forming a mask (104) over a portion of said edge (fig. 5); and
removing a portion of said conductive layer to form said protruding portion under said mask (fig. 6).

With respect to claim 21, Doan et al. discloses that the removing step comprises etching said conductive layer (col. 7, lines 1-5).

With respect to claim 22, Doan et al. discloses that the etching step comprises anisotropically etching said conductive layer (col. 7, lines 3-5).

With respect to claim 23, Doan et al. discloses that the etching step comprises isotropically etching said conductive layer (col. 7, lines 3-5).

With respect to claim 24, Doan et al. discloses that the mask has a lateral dimension less than 1000 Angstroms (col. 6, lines 40-42).

With respect to claim 25, Doan et al. discloses that the mask is a sidewall spacer and forming said mask step comprises forming said sidewall spacer (fig. 5).

With respect to claim 35, Doan et al. discloses that the forming said programmable resistance material step comprises forming said programmable resistance material adjacent to a top surface of said protruding portion (fig. 10).

With respect to claim 37, Doan et al. discloses that the conductive layer is a conductive sidewall layer or a conductive sidewall liner (fig. 1).

With respect to claims 38-39, Doan et al. discloses that the said programmable resistance material comprises a phase change material (a chalcogen element) (col. 7, lines 55-59).

With respect to claim 63, Doan et al. (figs. 1-12, cols. 6-8) discloses a method for making an electrode for a semiconductor device, comprising:

providing a conductive layer (102) (fig. 1); and
forming a protruding portion (114) extending from an edge of said conductive layer (fig. 6).

With respect to claim 64, Doan et al. discloses that the forming said protruding portion (114) step comprises: forming a mask (104) over a portion of said edge (fig. 5); and removing a portion of said conductive layer to form said protruding portion under said mask (fig. 6).

With respect to claim 65, Doan et al. discloses that the removing step comprises etching said conductive layer (col. 7, lines 1-5).

With respect to claim 66, Doan et al. discloses that the said etching step comprises anisotropically etching said conductive layer (col. 7, lines 3-5).

With respect to claim 67, Doan et al. discloses that the etching step comprises isotropically etching said conductive layer (col. 7, lines 3-5).

With respect to claim 68, Doan et al. discloses that the mask has a lateral dimension less than 1000 Angstroms (col. 6, lines 40-42).

With respect to claim 69, Doan et al. discloses that the said mask, is a sidewall spacer and forming said mask step comprises forming said sidewall spacer (fig. 5).

With respect to claim 79, Doan et al. discloses that the forming said memory material step comprises forming said programmable resistance material adjacent to a top surface of said protruding portion (fig. 10).

With respect to claim 81, Doan et al. discloses that the conductive layer is a conductive sidewall layer or a conductive sidewall liner (fig. 1).

Allowable Subject Matter

8. Claims 40, 42-46, 57-62, 82, 84-88, and 99-102 allowed.
9. Claims 36 and 80 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record fails to disclose the steps of forming a sidewall surface in the dielectric layer; forming a conductive layer on the sidewall surface and forming a protruding portion extending from the edge of the conductive layer while having the characteristics as recited in claims 40 and 82.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai V Pham whose telephone number is 703-308-6173. The examiner can normally be reached on 6:30A.M. - 6:00P.M..
12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

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13. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

HP
Hoai Pham
April 18, 2003



SUSAN D. PHAM, PRIMARY EXAMINER
TECHNOLOGY CENTER 2800